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Original Research Article

HRCT Findings in CSOM: A Cross Sectional Study

Okram Pusparani Devi[1], Khumanthem Shailendra Singh[2], Rajkumari Jayshree Devi[3], Dimpu Gangmei[4]

[1]Assistant Professor, Department of Radio-diagnosis, Jawaharlal Nehru Institute of Medical Sciences (JNIMS), Porompat, Imphal East, Manipur, India

[2]Assistant Professor, Department of Radio-diagnosis, Jawaharlal Nehru Institute of Medical Sciences (JNIMS), Porompat, Imphal East, Manipur, India.

3Associate Professor, Department of Radio-diagnosis, Jawaharlal Nehru Institute of Medical Sciences (JNIMS), Porompat, Imphal Easr Manipur, India.

4Senior Resident, Department of Radio- Diagnosis, Jawaharlal Nehru Institute of Medical Sciences (JNIMS), Porompat, Imphal East, Manipur, India.

Corresponding Author: Dimpu Gangmei

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Abstract

CSOM is a common disease of the middle ear that can cause serious life-threatening complications. Prognosis of patients depends on the early diagnosis and treatment. HRCT of temporal bone seems to have great value in the diagnosis and pre-operative assessment of CSOM. A cross sectional study was conducted to study the radiological findings (HRCT) of CSOM. Out of 60 patients, 38 of them were males. The most common age group was ≤20 years. Mastoiditis was the most common finding followed by TM perforation. Cholesteatoma and ear ossicle erosion was seen in 15% and 13% respectively. In maximum of the cases, mastoid air cells was involved followed by antrum. Complications was seen in 5 cases, 3 of them was mastoid abscess and one each of brain abscess and meningitis. HRCT of temporal bone is useful radiological investigation identifying various findings related to the location and extent of disease which are clinically occult and is of great importance in guiding the surgeon in planning the surgical approach.

Keywords: CSOM, HRCT, Temporal Bone.

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Introduction

CSOM is a chronic inflammation of the middle ear (>2 weeks) which causes ear discharge and is associated with hearing loss. Etiology may be bacteria or viral. Multiple episodes of acute otitis media, poor environmental/living conditions and poor eustachian tube function are at increased risk of CSOM. Craniofacial malformations such as cleft lip and palate, Down syndrome and microcephaly are also at higher risk. CSOM is usually initiated by upper respiratory tract infection which leads to middle ear mucosal edema, ulceration and thereby perforation. Ulceration may get resolved by production of granulation tissue and polyp formation which may lead to increased discharge. Failure to arrest the inflammation and to development of CSOM is associated with cholesteatoma formation. Excess pus drains to the outside of the ear (otorrhea), or there may be minimal pus enough to be seen only on examination with an otoscope or binocular microscope.[1] HRCT has a significant impact on the medical and surgical management of patients with middle ear disease. It confirms otoscopic findings to greater extent, clear many clinical doubts, and helps in determining surgical efficacy when surgery will be necessary and also for planning the approach for surgery. However, routine HRCT scanning prior to all surgery of cholesteatoma can only be justified if it can be shown to influence clinical management.[2]

The present study aims at studying the radiological findings of the temporal bone in patients with CSOM, to look at extent and sites of involvement of the middle ear and the mastoid air cells, to look for complications of CSOM (if any) and to establish role of HRCT temporal bone in medical as well as surgical management of patients with Chronic suppurative otitis media (CSOM).

Materials and methods:

A cross sectional study was conducted in JNIMS in the department of radiology, JNIMS in collaboration with department of otorhinolaryngology, JNIMS, Imphal Manipur among 60 CSOM patients. It was conducted for 2 years i.e., from March 2019 and April 2021. The study was conducted after the approval of institutional ethics committee and confidentiality of the patients were maintained. All the patients were performed HRCT of temporal bone. CT imaging was done with Toshiba CT machine (64 Slice). Analysis was done using IBM SPSS ver.16 after checking for correctness. Data were described using frequency and percentages. Ethical approval was taken from institutional ethics committee. Confidentiality was maintained throughout the study.

Results:

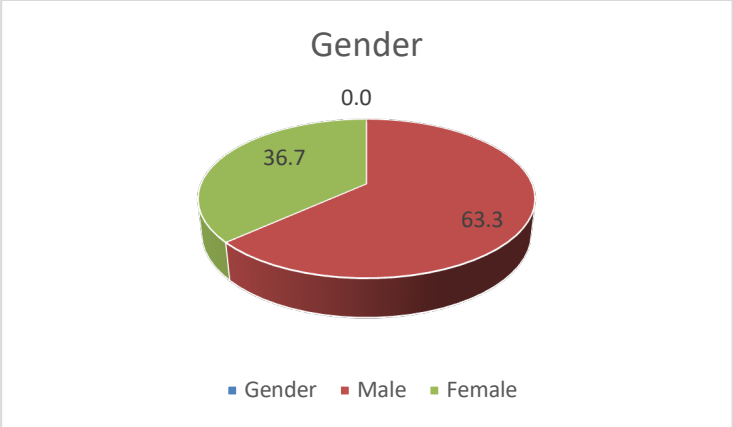

Figure 1: Pie chart showing age distribution of the respondents

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Table 1: Age distribution of the patients

Age in years	Frequency	Percentage
≤20	31	51.7
>20-40	18	30.0
>40-60	9	15.0
>60	2	3.3
Total	**60**	**100.0**

Majority of the patients were from the age group ≤20 years which contributed 51.7% of cases followed by 20-40 years (30.0%), 40-60 years (15%) and >60 years (3.3%).

Table 2: Distribution of the patients by HRCT findings

Findings	Frequency	Percentage
Mastoiditis	29	48.3
TM Perforation	11	18.3
Cholesteatoma	9	15.0
Ear ossicles erosion	8	13.0
Normal	1	1.7

Mastoiditis was present in majority of the patients in 48.3% of the patients, TM perforation in 18.3%, Cholesteatoma in 15.0%, ear ossicles erosion in 13.0% and one (1.7%) of them was normal.

Table 3: Distribution of the patients by site of involvement

Site of involvement	Frequency	Percentage
Mastoid air cells	34	56.7
Antrum	33	55.0
Epitympanum	32	53.3
Aditus	25	41.7
Hypotypanum	21	35.0
Mesotypanum	20	33.3
Perilabyrinthine cells	1	1.7

Mastoid air cells were the most involved (56.7%) followed by antrum (55.0%), Epitympanum (53.3%), Aditus (41.7%), Hypotypanum (33.3%), Mesotypanum (33.3%) and Perilabyrinthine cells (1.7%). Complications was seen in 5 cases as shown in table 3. Mastoid abscess was seen in 3 (5%) and brain abscess and meningitis in one each (1.7%).

Table 3: Distribution of the patients by complications

Complications	Frequency	Percentage
Mastoid abscess	3	5.0
Brain abscess	1	1.7
Meningitis	1	1.7

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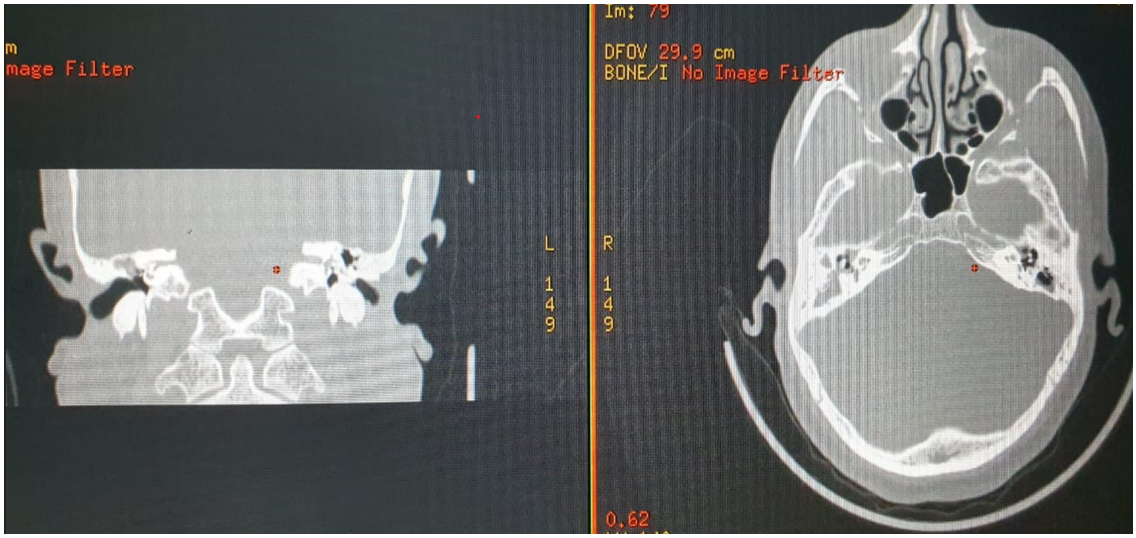

Figure 2: CT coronal and axial reformats showing soft tissue attenuating materials in bilateral middle ear cavities and mastoid air cells suggestive of bilateral CSOM and mastoiditis

Discussion:

CSOM was common in males in this study. Majority of the patients were from the age group ≤20 years which contributed 51.7% of cases followed by 20-40 years (30.0). Similar finding also noted in the study by Rokava TB et al[3] where CSOM was predominant in males and maximum of the patients were from 1-20 years. Mastoiditis was present in majority of the patients in 48.3% of the patients. This finding is in concordance with the finding by Vaidya V et al[4]. This is in keeping with the findings of E. Yorgancilar et al[5]. who stated that mastoiditis and mastoid abscess was the most common complication. Tympanic membrane perforation was seen in 18.3%, Cholesteatoma in 15.0%, ear ossicles erosion in 13.0% and one (1.7%) of them was normal in this study.

Mastoid air cells were the most involved (56.7%) followed by antrum (55.0%), Epitympanum (53.3%), Aditus (41.7%), Hypotypanum (33.3%), Mesotypanum (33.3%) and Perilabyrinthine cells (1.7%). The most common location and extent of disease on HRCT in our study was found to be holotympanic (40%) and most common was mastoid air cells in the study by Rokava TB et al[3].

HRCT of temporal bone is useful in identifying various findings related to the location and extent of disease which are clinically occult and is of great importance in guiding the surgeon in planning the surgical approach.

Conclusion:

CSOM is a common disease which can cause serious consequences. It is more prevalent among males and age below 20 years. HRCT of the temporal bone can get a clear picture of CSOM and its complications. It is useful in identifying various findings related to the location and extent of disease which are clinically occult and is of great importance in guiding the surgeon in planning the surgical approach.

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